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### TABLE OF CONTENTS

#### MEDICAL ABSTRACTS

Anthropology and Clinical Medicine.....	3
Cardiovascular Surgery - USNH Bethesda.....	6
Persons Injured in the Home.....	12
Salmonella Derby Epidemic.....	13

#### MISCELLANY

Armed Forces Writers League Contest (Chinfo Notice 5720) ....	15
Congratulations to Medical Service Corps.....	16
Armed Forces Orthopaedic Seminar .....	17
Twelfth AF Ob - Gyn Seminar, and Second Meeting AF Chapter - Amer College of Obstetricians .....	17
Radioisotope Technics and Nuclear Medicine Course.....	17
Rehabilitation Progress Report ...	18
Cholera Immunization (BuMed Notice 6230) .....	18
Air-Food Accidents' Prevention ...	19
Trichinosis in Wisconsin .....	19

#### FROM THE NOTE BOOK

RADM Tendler on Motivation for Naval Service .....	20
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#### FROM THE NOTE BOOK (Cont'd)

Change of Command at U. S. Naval Medical School .....	20
Seminar on Prophylaxis of Streptococcal Infections.....	21
NMRI Staff Members Participate in European Meetings .....	21
Thermal Stress Study in Hawaii..	21

#### DENTAL SECTION

Orderly Emergency Treatment of Facial Injuries .....	22
Professional Notes .....	24

#### AVIATION MEDICINE

Survival at Sea - Water Supply...	27
20/20 Tips for Flight Surgeons ..	30
Evaluation of Pilots Under Stress..	35

#### Historical Items:

Night Blindness .....	37
Portable Dark Room .....	37

#### RESERVE SECTION

Promotion of Officers (Finis)....	38
Overseas Travel and Residence..	39
Meetings:	
Amer Psychological Assn .....	39
Amer Academy of Dermatology	40

## MEDICAL NEWS LETTER

Vol. 42

Friday, 23 August 1963

No. 4

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.



### Anthropology and Clinical Medicine

By CAPT G. L. Calvy MC USN, Commanding Officer, Naval Medical Field Research Laboratory, Camp Lejeune, N. C., July 1963.

Constitution is defined as that aggregate of inherited characteristics, modified by environment, which determines the individual's reaction to the stress of environment. It is a basic belief of constitutional medicine that each individual possesses a factor of personal identity that marks him as a unique biologic specimen. This approach follows the best Hippocratic tradition and has been the principal basis for all medical practice since ancient times.

In the nineteenth century, study of the total organism was gradually overshadowed by a greater interest in tissue and component parts as the precepts of Pasteur, Koch, and Virchow provided a greater understanding of disease and the complex of factors involved. Current and continuing trends, however, again reveal more concern for the host, man, as he adjusts or fails to adjust to socio-economic pressures.

In this country, a significant trend in evaluating the man within the patient began in 1916 with the founding of the Constitution Clinic by Dr. George Draper at the Presbyterian Hospital, New York City. Stimulus for this project arose from his observations during the 1916 poliomyelitis epidemic in New York City that victims of this disease exhibit many shared characteristics. During the following 30 years, he sought intensively for a better understanding of people and the intrinsic factors which contribute to diseases such as peptic ulcer, pernicious anemia, coronary heart disease, diabetes, gallbladder disease, and rheumatic fever.

Draper conceived the idea of studying the total personality which he divided for convenience into four main categories, or panels. "The use of the term panel arose from the conception of a Japanese screen composed of four panels, across which was painted a complete picture; any one of the panels of such a screen alone would signify little, for upon it would be found but one phase of the whole." The panels selected for investigation were: (a) morphology, (b) physiology, (c) psychology, and (d) immunology. Data concerning the individual were gathered from all four panels.

This work furnished a base for the development of modern psychosomatic medicine. Reports reflecting progressive refinement and precision of method followed; these directed attention to the man-environment unit, the emotional components of somatic disease and, inexorably, the unity of the organism. This emphasis is credited by both Cobb and Braceland for the present day concept of psy(cho)somatic medicine.

### MORPHOLOGY

Many methods have been used to investigate man's individuality. The natural beginning for such a study is the physical structure, the tangible basis of personality. Sheldon made a great contribution in the field by showing that



there is a continuous distribution of patterns throughout a population. This fundamental idea is the basis of somatotyping as described by him in his book "Varieties of Human Physique." Sheldon bases his studies on photographs of the nude subject taken in standard manner in front, side, and rear views. Human morphology is described by Sheldon in terms of three primary aspects or components of structure that behave as though each were something which enters in varying amounts into every physique. These components are: I. Endomorphy, denoting presence of soft-roundness and the tendency to laying on of fat; II. Mesomorphy, denoting presence of hardness and squareness (muscular and bony); and III. Ectomorphy, denoting the presence of linearity, delicacy, and fragility of body structure.

Based on a study of several thousand individuals, Sheldon found that he could scale these components of structure on a 7-point basis. The pattern of the morphologic components, expressed as a series of three numerals, one for each component, he called the somatotype of the person. Thus, a physique with average and equal expression of each component would be designated as somatotype 4 4 4. The circus fat lady, Hercules, and the carnival thin man show the maximal endowment of components I, II, and III, respectively, and bear the somatotypes 7 1 1, 1 7 1, and 1 1 7. About 80 distinct somatotypes have been identified using the 7-point scale. Other morphologic characteristics are observable and may be scaled in a comparable manner.

Androgyny expresses the pattern of bisexuality that exists in every person and which Draper described as a mosaic. Andric and gynec factors are present in varying degrees of emphasis within every individual. These manifestations of sex in the extragenital sense are observable in all panels of the personality and may furnish valuable clues to diagnosis. Awareness of this mosaic and the character of its main theme (andric or gynec) in the individual is helpful in understanding the distribution of disease by sex; as an example, gout afflicts males in over 95% of recorded cases; the female with gout often exhibits striking andric characteristics of muscularity and aggressiveness.

Balance implies harmony of structure; disharmony or asymmetry of structure from zone to zone of the body is termed dysplasia and is suggestive of irregularities of growth and development. Sheldon somatotypes five zones of the body: (a) head and neck, (b) thorax, (c) lower trunk, (d) arms and hands, and (e) lower extremities. The final over-all somatotype is a summation of results from the foregoing. Texture is an expression of fineness as opposed to coarseness in the organism and may be observed in the quality of the skin, hair, and nails; this factor may correlate with "high personal quality" which may enable the individual to perform unexpectedly well in spite of limited physical strength.

#### CLINICAL APPLICATIONS

White recognized mesomorphy as a predominant feature in the somatotypes of persons with coronary heart disease; ectomorphy, in this same series of patients, was notably low. Pursuit of this clue is in progress at research centers. Gertler, Garn, and White have further elucidated this factor in identifying the "coronary prone" individual.



Males with gallbladder disease display more roundness and softness in their physiques than do ulcer patients, and also less ruggedness and linearity. The gynecic emphasis is strong and the somatotype shows component relationships averaging 4 4 2-1/2. On the other hand, ulcer patients vary widely in the morphologic panel, bear no characteristic somatotype, but reveal their identity more clearly in the panels of physiology and psychology.

Dupertuis, a clinical anthropologist, noticed that diabetic patients fall into two distinct morphologic groups. As a nonmedical person, he was unaware of the existence of the insulin-sensitive and insulin-resistant types of diabetes. His medical colleagues thereupon classified over 225 diabetic patients from the case record as either insulin-resistant or insulin-sensitive. There was significant correlation between the morphologic and clinical classifications (Table 1).

Table 1

Group	Average somatotype	Response to Insulin
I	5 3 2-1/2	Resistant
II	3 4 3	Sensitive

Other fundamental relationships between physique and physiologic function await investigation; both Dupertuis and Tanner have observed that serum cholesterol levels are high in individuals with predominantly endomorphic somatypes. Walker (Army) and Calvy, Cady, and Gertler (Navy-Marine Corps) have described lipid patterns in young adult male populations that confirm anthropologic observations.

Anthropology is but one aspect of the general approach, but already it has served a useful purpose in a wide range of clinical studies. Draper extended his observations regarding morphology to the microscopic level and demonstrated individuality, using the technic of cell culture. Distinct cell differences were demonstrable in those with peptic ulcer, gallbladder disease, poliomyelitis, and other disease patterns. Dupertuis, at Western Reserve University, has made substantial contributions to clinical medicine in collaboration with Caughey, Jefferies, and Hellerstein.

### SUMMARY

Sheldon's system of physical anthropometry offers a clinically applicable method for describing human physique. The application of this technic to clinical medicine offers promise for better understanding of the incidence of some diseases and of the man within the patient. Identification of the "coronary-prone" individual constitutes a significant breakthrough that has resulted from attention to study of the structure, performance, and problems of the whole man.

Cardiovascular Surgery - U. S. Naval Hospital  
Bethesda, Maryland  
 (Concluded)

By CDR J. E. McGlenathan MC USN. From the Proceedings of the Monthly Staff Conferences of the U. S. Naval Hospital, NNMC, Bethesda, Md., 1961 - 1962.

Not included in this series are the successful repair of one case of left ventricular aneurysm, and two cases of aortic sinus aneurysm with rupture into the right atrium and right ventricle. They are included under "Miscellaneous."

Aortic stenosis may be congenital or acquired, and in this series was limited to valvular and subvalvular areas. One case of muscular hypertrophy of the outflow tract is included. In children, the differentiation between congenital stenosis or that secondary to rheumatic fever is not difficult. Subvalvular stenosis is always congenital and may be a membranous or fibrous diaphragm. Congenital valvular stenosis may be due to a bicuspid valve or to

#### Aortic Valvular Lesions

Patients . . . . .	56	
Stenosis . . . .	36	Mortality . . . . . 3 - 8%
Insufficiency	20	" . . . . . 8 - 40%

fusion of two of the three commissures with the valve edges represented by thickened ridges. Calcification is usually not seen until young adulthood and may be extremely severe. In the acquired type, calcification of the entire aortic valve, annulus, and subvalvular areas is common and the effective valve orifice is represented by an eccentric slit.

Obstruction to flow across the aortic valve is the physiologic basis for increased ventricular work leading to left ventricular hypertrophy and further elevation of left heart and pulmonary vein pressures. The peripheral pulses are diminished and the pulse pressure narrows as the severity increases. Symptoms are those of inadequate cardiac output and are in direct proportion to the severity of the stenosis. Children usually do fairly well until puberty, although this lesion may be a cause of sudden death in infants. Syncopal and anginal attacks and muscular claudication are indications of severe stenosis. Diagnosis may be made on the above findings plus the presence of a "diamond" type systolic murmur in the aortic area accompanied by a palpable thrill. X rays may show cardiac enlargement or the presence of poststenotic aortic dilatation and also calcium in the valve. Angiocardiograms and left heart catheterization will accurately define the lesion, although differentiation of a high subvalvular from valvular stenosis is not clear cut.

Electrocardiograms show findings consistent with the severity and range from normal to the presence of both right and left axis deviation. In severe cases, the left dominance is always present with strain. The exception



which proves the rule occurred in the last case of acquired aortic stenosis repaired in which the electrocardiogram was normal and where the aortic valvular gradient was 85 mm Hg. This 43-year old patient had syncopal attacks for 15 years.

Surgery is indicated in patients who have progression of symptoms and deterioration in the electrocardiogram. It is directed toward relief of the obstruction and mobilization of the valves with care being taken to avoid production or increase in insufficiency. Three cases were treated either by instrumental transventricular or digital transaortic valvulotomy and, although all survived with improvement, 2 are being considered for open repair. The remaining 33 patients were operated by open technics, one with hypothermia and inflow occlusion, the others with the aid of the heart-lung machine and cardiac arrest.

### Aortic Insufficiency

The 20 cases represented in this series include 4 who probably had Marfan's syndrome with medial aortic disease and aneurysmal dilatation of the aortic root. All cases had wide open aortic insufficiency (9 on the basis of rheumatic valvulitis) and all were repaired by the open method. Two cases were treated prior to the availability of the bypass by insertion of a Hufnagel valve; these cases are included under "Miscellaneous."

The pathologic physiology of this lesion is the lack of diastolic blood pressure. This produces extremely wide pulse pressures and cardio-aortic dilatation. As the heart hypertrophies with increased work and oxygen requirements, angina develops because the low diastolic pressures depreciate adequate coronary filling.

Diagnosis is based on the above findings and presence of wide pulse pressures, lack of diastolic blood pressure, bounding pulses, and loud aortic diastolic murmurs. X rays, electrocardiograms, and catheterization together with dye dilution technics may quantitate the lesion but usually offer no further diagnostic aid.

All patients in this series were extremely ill and required rigid medical regimens and were selected for surgery because of impending loss of medical control. Methods of repair included plastic repair of the aortic annulus; excision of the noncoronary sinus with modification of the aortic root and bicuspidization of the aortic valve and single, double, and complete cusp replacement with silastic monocusps.

### Tetraolgy of Fallot

Patients .....	48
Mortality .....	10 - 20.8%
Ages .....	8 weeks to 11 years
Pott's Procedures ....	14 - 5 deaths
Blalock Procedures ...	28 - 1 deaths
Open Correction .....	6 - 4 deaths



This malformation was long believed to be the commonest congenital cyanotic condition. It is the commonest which permits relative longevity. Described by Stensen in 1671, Sandifort in 1777, and in detail by Fallot in 1888, the lesion consists of ventricular septal defect, pulmonic stenosis (valvular or infundibular), right ventricular enlargement, and dextroposition of the aorta.

This combination of defects permits shunting of unsaturated blood from the obstructed right ventricular outflow tract to pass through the ventricular defect into the systemic circulation. The dextroposition and right ventricular hypertrophy are really not seriously concerned with the abnormal physiology.

These children may be acyanotic at birth by virtue of flow through a patent ductus and become cyanotic only as the ductus closes during the first year of life. During this period, collateral flow to the lungs develops, the patient increases his red cell mass and hemoglobin and, thus, compensates to a degree for his disability. Clinical findings show a small cyanotic child who frequently squats. Many infants and children may show episodes of loss of consciousness; this is a serious threat to life. As the child grows, clubbing of the extremities is noted and telangiectasia and purpuric spots may be seen. The murmur and thrill of pulmonic stenosis is usually present and the second pulmonic sound quiet. X rays show a small "boot-shaped" heart due to absence of the pulmonary vessel shadows. The lungs are avascular. Angiocardiograms will delineate the area of pulmonic stenosis and establish the relative size of the pulmonary vessels and the position of the aorta. Cardiac catheterization further identifies the presence of associated septal defects. Laboratory findings are consistent with the degree of cyanosis and, if polycythemia is severe, platelet and fibrinogen deficits may be present. The electrocardiogram shows right ventricular hypertrophy.

Palliative surgery in the form of Pott's or Blalock shunts are indicated in the seriously ill infant and child. Ideally, they should be delayed to ages 8 to 12 years if possible for one may expect good palliation in this group. Total correction should be reserved for those patients who have adequate pulmonary vessels.

#### Open Heart Surgery

Briefly, this modality of surgical endeavor may be performed with the aid of total body hypothermia in the range of 30°C. This permits occlusion of venous inflow to the heart and allows periods up to 5 minutes of relative circulatory arrest. Small atrial septal defects of the secundum type, valvular pulmonic and aortic stenosis are the simpler cardiac lesions in this series repaired by this method. In the majority of cases, however, the heart-lung machine is employed. In this series, a modified Kay Cross disc oxygenator with an incorporated thermoregulatory device together with a piston compressed pump and unidirectional valves served in an exemplary manner. By this technic, all venous blood is withdrawn from the venae cavae, passed through the pump oxygenator, and returned to the systemic circulation, thus bypassing the heart and lungs. For lesions in the aortic valves or ventricular



defects, cardiac arrest is employed. At the present time, cardiac hypothermia in the region of  $12^{\circ}$  to  $15^{\circ}\text{C}$  induced by the application of iced saline produces satisfactory arrest for periods up to 100 minutes.

### Pulmonic Stenosis

Patients .....	36
Mortality.....	3 - 8.3%
Infundibular ....	8
Valvular .....	16
Combined .....	12
Ages .....	3 weeks to 35 years

This entire series was believed to be congenital in nature. Excluded from this group are those cases with ventricular septal defects (Tetralogy) and included are 3 which were additionally found at surgery to have a patent foramen ovale. Physiologically, the problem is obstruction to flow into the lungs. The patients are acyanotic unless the foramen ovale is open and then cyanosis is intermittent. Extreme stenosis will produce peripheral cyanosis. Symptoms depend upon the severity of the stenosis and consist of dyspnea and fatigability. A systolic thrill and murmur are present in the pulmonic area and a precordial heave is present due to right heart hypertrophy. X rays show hypovascular lung fields and may show poststenotic pulmonary artery dilatation. Heart size is usually normal but may be enlarged. Angiocardiography and catheterization will accurately delineate the location and severity of the lesion and is usually indicated. Electrocardiograms show right axis deviation and, with long-standing cases, will show hypertrophy and strain.

Surgery is indicated in all cases of stenosis with pressures in the right ventricle over 60 mm Hg and progressive symptoms and in this series has been done by transventricular instrumental incision, open valvulotomy with the aid of hypothermia and inflow occlusion and by open repair with the heart-lung machine. The infants in this series were done as emergencies, all others were elective. Valvular stenoses were repaired by incision of the cone-like valve along the rudimentary commissures. Combined lesions and infundibular obstructions were treated by resection of the hypertrophied outflow tract and also by resection plus placement of a plastic patch in an incision from the pulmonary artery to the lower right ventricle. The production of pulmonic insufficiency in the latter cases has not produced any evident physiologic problem.

### Atrial Septal Defects

This entire series was congenital in origin and not included are those small defects associated with pulmonic stenosis.

The pathophysiology of this lesion is a left to right shunt of blood at the atrial level producing gross cardiac enlargement primarily of the right heart and pulmonary vessels. Symptoms vary depending upon the volume of the shunt. The patients may seem normal until the third or fourth decade when progressive fatigability, dyspnea, and heart failure occur. Examination

shows a soft systolic precordial murmur and the second pulmonary sound is widely split. X rays show hypervascularity of the lungs, right heart, and pulmonary artery enlargement. Cardiac catheterization and selective dye studies will identify the location of the defect, quantitate the shunt, and localize anomalous pulmonary veins. The table of atrial septal defects follows:

Patients .....	76
Mortality 1 - 1.37%	
a. Ostium Secundum: Single .....	41
Multiple .....	5
b. Ostium Primum -	
Tricuspid and Mitral Insufficiency .....	16
c. Ostium Secundum -	
with anomalous pulmonary venous	
drainage .....	14
Complications - two complete heart block	
which later reverted	

In atrial septal defect not involving the lower limits of the atrial septum and not involving the mitral or tricuspid valve, the electrocardiogram usually shows right axis deviation and right bundle branch block. In atrial septal defect that involves the lowermost portion of the atrial septum (ostium primum type) or that is associated with involvement of the mitral or tricuspid valve, the electrocardiogram also reveals a right bundle branch block pattern but, in addition, reveals a characteristic and unusual left axis deviation.

Indications for surgery include patients with pulmonary systemic flow ratios greater than 2 to 1. Symptomatic patients with smaller shunts also will benefit from surgery. Repair was accomplished in one case by inflow occlusion with hypothermia and in all others by open repair and the heart-lung machine. Direct suture is optimal; however, plastic patches are used to close the defects if tension on the suture line is present. Mitral insufficiency was repaired by direct suture via the septal defect which was then repaired, followed by suture of the tricuspid insufficiency. All but one case of anomalous pulmonary venous drainage occurred on the right side and were repaired usually by partitioning of the superior vena cava and transposing the atrial septum.

#### Ventricular Septal Defects

Patients .....	13
Fenestrated .....	2
Membranous .....	11
Patients 1 through 5 died .....	2 - complete heart block
	1 - hyperthermia
	2 - air embolus

Patients 6 through 13 closed.

Not included in this series are 14 infants with large ventricular defects and pulmonary overload who were treated by banding of the pulmonary artery.



These are included under the heading of Miscellaneous Procedures. The first five patients were children in the 20 to 30 pound size with progressive difficulty and pulmonary artery pressures approaching 70 mm Hg. Done early in this series, two were found to have multiple fenestrations of the muscular septum and incomplete closures resulted. Complete heart block occurred twice and one patient experienced a severe hyperthermic reaction prior to going on the pump. Two of these children were apparently convalescing nicely and suddenly expired on the first and second postoperative days, respectively.

This lesion produces a left to right shunt which varies in volume depending upon the size of the defect. Since the shunt is left to right, the patients are acyanotic. If the shunt is small, the lesion is called the *Maladie de Roger* and these patients are not selected for surgery. If large, pulmonary flow is greatly increased and the resulting pulmonary hypertension may become irreversible. At this time, the shunt may reverse, cyanosis appear, and thus surgery may be contraindicated.

Physically, these patients have a loud systolic murmur heard over the precordium, especially to the left of the sternum. The heart is normal in size and X rays show increased pulmonary vasculature. Selective angiocardiography and cardiac catheterization are indicated. Surgical closure is indicated in young children if pulmonary pressures are rising or if progressively more difficulty is experienced in medical control. Cold cardiac arrest has facilitated the transventricular repair of these lesions and, since this technic has been used, no instances of heart block have occurred. The last two cases of ventricular septal defect repaired were in adults who also had aortic valvular insufficiency and transaortic repair was accomplished successfully.

#### Miscellaneous Procedures

Patients .....	78
Mortality 16 - 20%	
1961: Tricuspid Atresia .....	4
Thoracic Aneurysms .....	9
Pericardial Cysts .....	2
Transposition .....	4
Exploration Great Vessels .....	1
VSD and Pulmonary Hypertension ...	4
	<hr/> 24

This 1961 sampling is representative of the 10-year experience in cardiovascular surgery. Others have been mentioned in previous discussions. Many procedures, especially those for tricuspid atresia, transposition, and ventricular septal defects with pulmonary hypertension, are done as emergencies in critically ill infants. The high mortality rate occurs in these patients and is further accentuated because the procedures are palliative rather than curative. Occasionally, complex anomalies are encountered which defy palliation. It is the hope of the cardiovascular surgeon that these children may be tidied over for definitive surgery on their lesions when such is available. The other categories listed have received definitive surgical correction; the

pericardial cysts were excised and 8 of the 9 aneurysms resected and replaced with grafts. The other aneurysm was wrapped with dacron mesh.

### Conclusion

A review of cardiovascular surgery at the U.S. Naval Hospital, NNMC, Bethesda, Md., is presented. Seven hundred thirty cases were performed with a mortality of 7.8%. These 730 cases have been categorized and significant statistics outlined. Present methods and technics of open heart surgery are outlined and brief mention made of other technics.

\* \* \* \* \*

### Persons Injured in the Home

Health Statistics from U. S. National Health Survey, Series B-No. 39,  
Dept of HEW, Public Health Service, July 1959 - June 1961.

Selected Findings. An average of 20 million persons were injured at home each year in the United States, July 1959 through June 1961. These figures refer to the civilian noninstitutional population and include only injuries requiring medical attention or causing the person to restrict his usual activities for at least one day. "In the home" in this report means in or around the person's own home or the home of another person.

The 20 million persons comprise about 45% of those injured during the 2-year period, representing a rate of 114.5 per 1000 population per year. Among females the rate of injuries, 120.2 per 1000 population, exceeded that of males, 108.4 per 1000. Of all individuals injured in the home, 53.2% were inside the house. The remaining 46.8% were outside the house but on the premises. However, 55.1% of males were injured in the home but outside the house. Children under 15 years had a high rate of accidents, 173.9 per 1000 accounting for 48.6%. Under the age of 5 years, the rate was 208.9 per 1000 children. Among persons living in rural non-farm areas, 125.6 persons were injured per 1000 population per year. This rate was appreciably higher than for persons living in other areas - 109.9 in urban areas, and 111.6 in rural-farm areas.

Of all persons injured in the home, 34.2% sustained falls. These were grouped into two categories: "falls on stairs, on steps, or from a height," 15.0%; and "all other falls," 19.2%. Persons "struck by moving object" numbered 8.4%; this type of accident yielded the third highest number of casualties in the home.

Of the 114.5 persons injured in the home per 1000 population, 23.9% had subsequent bed disability. About 20.2 per 1000 of the regularly employed population lost one or more days from work because of physical trauma.

Approximately 162,860,000 days of restricted activity were attributed to injury in the home, a rate of 92.4 days per 100 population. Of these days of restricted activity, 40,893,000 were bed-disability days and 17,111,000 were work-loss days.



NOTE: This PHS study highlights the home accident problem and should generate a determination of All Hands to improve home-safety records. A preventive program should be practiced in every home for it is entirely feasible if thought is applied to the task. Anyone who has attended a patient who is paralyzed from the neck down (e. g., from diving into water of unknown shallow depth or from falling down a stairway) will appreciate the sadness of the victim's fate. Motor vehicular and home accidents combined are a National smudge and a preventable disgrace. The health, economic, domestic, and situational impact has spelled catastrophe for untold tens of thousands of homes. —Editor

\* \* \* \* \*

### Salmonella Derby Epidemic - Follow-up Report

Morbidity and Mortality Weekly Report, Dept of HEW, CDS-PHS 12(28): 230-231 and 236, 19 July 1963.

The interstate epidemic of hospital associated Salmonella derby infections, first noted in March, continues. (See MMWR Vol 12, pp 220, 199, 182, 173, 167, and 159). From March 1 to July 8, a total of 775 isolations of S. derby has been reported from 25 States and the District of Columbia (Table 1).

TABLE 1 REPORTED S. DERBY ISOLATES MARCH 1, 1963 - JULY 8, 1963

State	No. Hospitals Involved	Hospital Associated	Community Acquired	Unknown	Under Investigation	Total
Alabama			2			2
California			11	3	5	19
Connecticut	3	4		1	1	6
Delaware	2	3	1		1	5
District of Columbia			1	2		3
Georgia			1	1		2
Hawaii				2	18	20
Illinois	1	1	2		3	6
Indiana	1	1				1
Louisiana			2		1	3
Maryland			4	3	2	9
Massachusetts	4	5	9	3	9	26
Michigan			2	1		3
Minnesota			2			2
Missouri			2		3	5
New Jersey	5	13	4	1	2	20
New Mexico					1	1
New York	9	60	2	4	9	75
North Carolina			3			3
Ohio	3	4	6	6	1	17
Pennsylvania	11	507*	13**	1	11	532
Rhode Island	1	3		1		4
Texas			3			3
Virginia			1	1		2
Washington					4	4
Wisconsin				1	1	2
<b>TOTAL</b>	<b>40</b>	<b>601</b>	<b>71</b>	<b>31</b>	<b>72</b>	<b>775</b>

\* More than 50 percent of this total represents recoveries resultant from secondary spread of infection in 5 different hospitals.

\*\* At least 3 cases represent infection acquired from contaminated turkey roll.

TABLE 2 FATALITIES ASSOCIATED WITH THE ISOLATION OF S. DERBY DURING HOSPITALIZATION

STATE	AGE AND SEX OF PATIENT	OTHER DIAGNOSIS
1. Pennsylvania	80 M	Chronic duodenal ulcer with obstruction
2. Pennsylvania	18 F	Staphylococcal pneumonia
3. Pennsylvania	64 M	Diabetes mellitus
4. Pennsylvania	50 F	Ulcerative Colitis
5. Pennsylvania	56 F	Melanoblastoma
6. Pennsylvania	74 F	Ulcerative Colitis
7. Pennsylvania	78 F	Hypertensive cardiovascular disease
8. Pennsylvania	81 M	Fractured hip
9. Pennsylvania	53 M	GI Surgery
10. Pennsylvania	69 M	Carcinoma bladder
11. Pennsylvania	9 M	Myeloblastoma
12. Pennsylvania	63 M	Pulmonary carcinoma
13. Pennsylvania	F	Fractured hip
14. Pennsylvania	74 F	Renal failure, hepatic failure
15. New York	30 F	Hodgkins Disease
16. New York	59 M	Carcinoma bladder

Of the 775 isolations of S. derby, 601 have been classified as "hospital associated" infections and have occurred in 40 hospitals in 10 States. The problem is concentrated largely in the Northeastern portion of the country. During this



same period there have been 71 infections classified as "community acquired." These have been reported from all parts of the country. Their frequency has been comparable with the normal endemic incidence of S. derby isolations (approximately 20 per month).

Since the epidemic began, 16 fatalities have been reported among patients from whom S. derby was isolated (Table 2). Most of these patients were suffering from serious debilitating or life threatening diseases; however, in at least one instance, the Salmonella infection was considered "a highly contributing" factor in the patient's death.

In each of the involved hospitals a consistent epidemiologic pattern has been observed. The initial isolations have been recognized among patients with gastrointestinal disease, often postoperative and usually during the second week of hospitalization. Multiple cases have appeared in widely separated parts of the hospital within relatively short intervals of time.

Common sources of infection, such as contact with possibly infected persons, exposure in specific locations, common therapeutic or diagnostic procedures, or common medications have been notably absent. In some hospitals, secondary spread of infection has become a difficult and continuing problem. This has complicated epidemiologic analysis.

The almost simultaneous appearance of these infections in many hospitals in several States clearly incriminated some common source of infection in interstate movement. The following possibilities have been considered: (1) interchange of patients or personnel; (2) use of diagnostic or therapeutic agents; and (3) dietary items.

Intensive investigations for these possibilities were carried out in 22 hospitals. The first two could be clearly excluded. The third, dietary items, presented a wide range of potentially suspect foods. Histories of foods consumed during the period of 48 hours prior to onset among approximately 200 of the "initial" patients revealed that most were receiving highly restricted diets. Thus, many potential food items could be excluded from further consideration. Only one particular item of food was almost universally consumed by the patients. This was raw or undercooked eggs.

Therefore, a careful search was made of sources of the eggs supplied to 15 hospitals in 3 States. Among a large number of egg farms identified, only those in two localized geographic areas could possibly have supplied these 15 hospitals. Samples of eggs (235 dozen), pooled chicken droppings (5400 specimens) and poultry feed (58 specimens) were obtained from both areas. S. derby was recovered from one sample of feed and 4 pooled samples of cracked eggs in one of these areas.

Upon review of data accumulated, the Surgeon General of the Public Health Service released the following recommendation on July 11, 1963:

"There is sufficient epidemiologic and bacteriologic evidence to suggest that everyone should avoid buying and using cracked or unclean eggs. Persons who are ill—especially infants, the elderly, and individuals suffering from gastrointestinal diseases or malignancies—should not be fed raw or undercooked eggs. An undercooked egg is one in which the white is not firm.



It is recognized that cracked eggs are used for a variety of commercial purposes. So long as eggs used for these purposes are thoroughly cooked and the final product is not recontaminated, there is no inherent danger to the continued use of these eggs for this purpose. Thorough cooking will effectively sterilize the product."

(Based on studies conducted by State and local health officials, the Food and Drug Administration, the staffs of numerous hospitals, and teams from the Communicable Disease Center.)

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## MISCELLANY

DEPARTMENT OF THE NAVY  
Office of Information  
Washington 25, D.C.

CHINFO 5720  
OI-400  
16 July 1963

### CHINFO NOTICE 5720

From: Chief of Information  
To: All Ships and Stations

Subj: Armed Forces Writers League Contest

**1. Purpose.** The purpose of the Notice is to inform Naval personnel of the 1963 Armed Forces Writers League Short Story Contest.

**2. Information.** The Armed Forces Writers League has announced the rules governing its 1963 short story contest for amateurs. The annual event will be open to all Armed Forces personnel and their families and is designed to encourage novice authors to submit their best stories so that they may benefit from evaluations and suggestions provided by League professionals who serve as judges. Each entry must be the original work of the author, not previously published or awarded a prize in any other literary contest, must be accompanied by

an entry blank, an entry fee of \$1.00, and a stamped return envelope. Stories may not exceed 2,000 words. Cash awards will be given to the winners. All entries must be received by the contest chairman by 15 September 1963.

**3. Action.** Commands are requested to encourage participation and to advise interested personnel that additional information and entry blanks may be obtained by writing to the Contest Chairman, Armed Forces Writers League, 2818 Pennsylvania Avenue, N.W., Washington 7, D.C.

**4. Cancellation.** This Notice is canceled upon completion of the indicated action, and for record purposes on 30 September 1963.

J. S. DOWDELL  
Deputy



## TO THE OFFICERS OF THE MEDICAL SERVICE CORPS

On this 16th Anniversary of the Medical Service Corps of the U.S. Navy, I extend greetings and congratulations to all of you. Although small in number you have, through the successful accomplishment of the many demands placed upon you and the effective utilization of your many skills and abilities, deservedly become a very important component of the Navy Medical Department. I have every confidence that you will continue to discharge your responsibilities and meet new challenges with the determination and ability you have demonstrated so well in the past.

To each and every member of the Navy Medical Service Corps I extend my personal regards and wish you a HAPPY BIRTHDAY.

/s/ FRED KORTH  
Secretary of the Navy

It is with pride and pleasure that I express my sincere congratulations to all of you on this occasion of the 16th anniversary of the establishment of the Navy Medical Service Corps. I do this with full knowledge of your many contributions to the mission of the Navy Medical Department and with complete reliance on your continued loyalty and devotion.

This is also an occasion for looking forward and for resolving to add to the already many accomplishments made by your Corps. I have every confidence that each and every one of you will do so and, by continuous self-improvement, your many and diversified skills will continue to enhance the excellent reputation earned by the Medical Service Corps through its first 16 years of existence.

To each of you wherever serving, HAPPY BIRTHDAY.

/s/ E. C. KENNEY  
Rear Admiral MC USN  
Surgeon General



Armed Forces Orthopaedic Seminar  
17 - 20 September 1963

The Army will act as host for this seminar which will be held at Letterman General Hospital, Presidio of San Francisco, Calif., on the above dates. For further information refer to next announcement below.

Twelfth Armed Forces Obstetrics - Gynecology Seminar  
7 - 10 October 1963

The Army will also host this seminar at Letterman General Hospital. All surgeons and residents on active duty are eligible to attend the seminar appropriate to their specialty. Only a limited number of officers can be authorized to attend these seminars on travel and per diem orders chargeable against Bureau of Medicine and Surgery funds. Eligible and interested officers who cannot be provided with travel orders to attend at Navy expense may be issued Authorization Orders by their Commanding Officers following confirmation by this Bureau that space is available. Requests should be forwarded via chain of command in accordance with BUMED INSTRUCTION 1520.8. Note that requests for the Twelfth Annual Obstetrics - Gynecology Seminar must be submitted at least 6 weeks prior to commencement of the seminar.

During this meeting there will also be a Second Meeting of the Armed Forces Chapter of the American College of Obstetricians.

Radioisotope Techniques and Nuclear Medicine -  
Course for Medical Officers

Class Number

Inclusive Dates

Class #15

13 January through 3 April 1964

The above scheduled class will be conducted at the U.S. Naval Medical School, National Naval Medical Center, Bethesda, Md. In view of the limited quota and shortage of travel funds for attendance at short courses, only those Medical officers who require the course as an integral part of their residency training or as an important factor in the performance of their current assignment can be authorized to attend. Travel and per diem funds will be provided in accordance with budgetary limitations. Officers who cannot be provided with travel orders to attend at Navy expense may be issued Authorization Orders by their Commanding Officers following confirmation by this Bureau that space is available in each case.

Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.8 at least six weeks prior to commencement of the requested course.

(Above announcements are made by the Training Branch, ProfDiv, BuMed.)

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### Rehabilitation Progress Report

The social and vocational problems with which hemophilia victims must grapple, along with their lifelong acute physical difficulties, are discussed in the May - June issue of Rehabilitation Record, professional magazine of the Vocational Rehabilitation Administration, Dept of HEW. The article was written by Gilbert R. Barnhart, former chief of VRA's research division, and describes a VRA supported study of more than 1000 men afflicted with this blood disorder. Dr. Alfred H. Katz of the University of California Los Angeles conducted the study. The findings, some of which have not hitherto been widely known, include:

The image which the hemophiliac has of himself as a functioning individual does more to determine his social and vocational success than either his physical condition or the type and extent of his education. This image is heavily influenced by his parents' attitudes toward him and his illness in childhood.

More than half of the hemophiliacs in the study suffer annually at least two hemorrhages requiring transfusions and, usually, hospitalization. More than three-fourths have difficulty with one or more major joints—knees, elbows, or ankles—because of internal bleeding.

Half of them are employed, almost all full time; their salaries and diversity of occupations were about like those in the general United States population. More than a third of the working group, however, missed from 15 to 60 days of work a year because of hemophilia.

Most hemophiliacs lived with their families or other relatives; only five percent lived alone.

Also, in the VRA magazine, Andrew Marrin, director of the State rehabilitation program in California, reports on 10 years of special effort to rehabilitate disabled welfare clients in the State. The program has taken 5422 of these handicapped persons off public assistance payments and put them to work at a saving of more than seven and one-half million dollars in welfare funds.

Not only did this program teach his staff that many welfare clients can be made self supporting, said Mr. Marrin, but it also indicated that "more people want to be self sufficient than to be parasites, that few people in our culture are satisfied for long with being dependent, and that people are made of better stuff than is apparent on the surface."

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**BUMED NOTICE 6230** of 19 July 1963 outlines the requirement for cholera immunization for Guam and the U.S. Trust Territories of the Pacific Islands. It implements the additional safeguard of cholera immunization for personnel traveling to or stationed in those areas.

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### Prevention of Air-Food Passage Accidents

An educational program is being adopted as a preventive means toward curtailing foreign body accidents involving air and food passages, according to Dr. Stanton A. Friedberg, President of the American Broncho-Esophagological Association.

Originally conceived by Dr. Paul Bunker of Aberdeen, S. D., the project is being undertaken because of numerous deaths occurring annually from unrecognized foreign bodies obstructing air or food tracts.

Dental factors, it is pointed out, are present in a high percentage of all foreign body accidents because patients with dentures are particularly susceptible as a result of not detecting the presence of bones or bony fragments in food. The South Dakota Dental Association has prepared a special pamphlet for new denture wearers, warning them of foreign body hazards; the brochure also includes a section for parents regarding the dangers of feeding certain foods to children before development of the grinding action of molar teeth.

Among other groups offering support for the program are The American Dental Association, the Committee on Broncho-Esophagology of the American College of Chest Physicians, the Committee for the Prevention of Accidents of the American Academy of Pediatrics, and the American Red Cross.

—Newsletter, Amer Coll of Prev Med 6(2) July 1963.

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### Trichinosis in Wisconsin

Circumstances related to the occurrence of trichinosis in a Wisconsin University graduate student provided a unique opportunity to demonstrate the source of the infection, contaminated pork chops.

About October 1, 1962, two graduate students who shared cooking facilities purchased two thick pork chops at a local market. Hasty preparation resulted in inadequate cooking of the chops. Both chops were sampled but then refrigerated. One of the students consumed one of the chops on the following day.

Three weeks later, he experienced anorexia and nausea without vomiting or diarrhea, followed by aching muscle pains in the chest and back, malaise, nonproductive cough, chills, and fever to 103°. His eyelids became swollen and he developed severe throbbing headaches and boring eye pain. He was admitted to the hospital on November 3. A trichinella skin test was positive; biopsy of the gastrocnemius muscle revealed Trichinella spiralis. He recovered uneventfully. The second student experienced similar but milder symptoms. His skin test was equivocally positive.

After discharge, the patient brought the remaining, now six-week old pork chop to the State Laboratory of Hygiene. Microscopic examination revealed encysted T. spiralis in the meat.

(Reported in the State of Wisconsin Laboratory of Hygiene Newsletter)

—Morbidity and Mortality Weekly Report,  
CDC, PHS, Dept of HEW, 17 May 1963



## FROM THE NOTE BOOK

Admiral Tendler on Motivation for Naval Service

Rear Admiral Morton J. Tendler MC USNR (Ret), Associate Professor of Surgery, University of Tennessee, recently forwarded a letter to the Bureau which is quoted in part, with his permission:

"I am enclosing a letter which you can use plus a note from the father of our prospective Naval officer who is one of our foremost citizens. When it comes to motivation, it is so infrequent that one finds as fine and personable a young man with such an earnest outlook. When I think back to World War I and to 'the preliminaries of World War II,' I don't believe that I could have expressed myself as succinctly nor as beautifully as young Doctor \_\_\_\_\_ did" (in the following letter).

'I would again like to express my most sincere thanks for your kindness in writing the letter to the Navy concerning my application for internship. It is my pleasure to be able to tell you that I have been accepted for internship at the U. S. Naval Hospital, \_\_\_\_\_, \_\_\_\_\_, beginning 1 July 1963.

I am looking forward to the over all experience in the Navy. Perhaps you will understand if I say that I feel that this time in the Service will be in some small way my part in a debt every American owes to this Country, whatever its weaknesses may be. I am proud to be an American, and I am not ashamed to feel this from my heart. You have given much of your life in the Service, so you must have felt somewhat similar. Perhaps at times I am a bit of a dreamer and idealist, but this is a part of life's experiences to which I look forward without dread or the feeling that it is time of which I am being deprived. '"

NOTE: Our appreciation is offered the Admiral for this item. Our interns—each year—are a group of fine officers who enjoy the wholesome respect of their superiors. We like them and are proud to have them aboard.

—Editor

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Change of Command at U. S. Naval Medical School. CAPT John H. Stover Jr, MC USN assumed command of the U. S. Naval Medical School, National Naval Medical Center, on Friday, 26 July 1963. CAPT Stover, who reported to NNMCC following graduation from the Naval War College, Newport, R. I., relieved CAPT Paul F. Dickens Jr, MC USN. CAPT Dickens, who took command of the Medical School in August 1962, will report to the Naval Radiological Defense Laboratory, San Francisco, Calif., where he will serve as Liaison Officer for the Bureau of Medicine and Surgery.



The Seventh Annual Seminar on the Prophylaxis of Streptococcal Infections, sponsored by the Armed Forces Epidemiological Board will be held at Fort Ord, Calif., Monday and Tuesday, 30 September - 1 October 1963. Activities desiring to send representatives to this seminar should submit letter requests to BUMED, Attention Code 316, in accordance with BUMED INSTRUCTION 1520.8 as soon as possible.

NMRI Staff Members Present Papers at European Meetings.

Dr. H. T. Meryman, Head, Cryobiology Division, Naval Medical Research Institute, NNMC, attended a Symposium on Cytoecology in Leningrad, U. S. S. R., 28 May through 6 June 1963. This conference was held under the joint sponsorship of UNESCO and the Soviet Academy of Sciences. The Institute of Cytology in Leningrad was the principal sponsoring Institute. Dr. Meryman, one of 10 participants from the West, presented a review of all current theories concerning the mechanisms of freezing injury with a citation of both supporting and contradictory evidence for each.

CAPT H. G. Wagner MC USN, Executive Officer and Acting Director, Physiological Sciences Department, and CAPT E. L. Beckman MC USN, Aviation Medicine Division, attended the 20th meeting of the AGARD Aero-Space Medical Panel, Athens, Greece, 5 - 12 July 1963. CAPT Wagner spoke on the retinal burn problem and CAPT Beckman's presentation was on the physiologic effects of immersion. At the conclusion of the meeting, Drs Wagner and Beckman visited several research laboratories and universities in England; on 22 July, Dr. Wagner went to the Netherlands and Belgium to attend the Fifth International Congress on Medical Electronics in Liege. He presented a paper entitled, "Glass Insulated Micro Electrodes, Design and Fabrication."—NMRI NOTES 1(7), July 1963.

Thermal Stress Study Trip. CAPT D. Minard MC USN, LT L. Copman MC USN, LTJG A. R. Dasler MSC USN, and HM3 W. K. Mitchell of the Stress Physiology Division, NMRI, spent the period, 24 April to 11 May in Pearl Harbor, Hawaii, studying and evaluating the thermal stress caused by protective clothing against agents used in ABC warfare.

Following extensive preliminary laboratory tests at NMRI, actual ship-board trials were carried out aboard the USS TIOGA COUNTY (LST 1158) while underway in the Pacific. Effects of radiant solar heat and of air movement on the internal body temperatures, heart rates, and tolerance times of subjects wearing this clothing were of particular interest. Requirements for external cooling, using water spray facilities aboard ship, under various environmental conditions were evaluated. In addition, metabolic rates and other physiologic measurements were taken on members of the ship's crew while performing simulated decontamination procedures.

Information gained from these studies will be included in a report to the Bureau of Ships and is expected to be of great value in increasing the safety and efficiency of military personnel who may be called on to wear such clothing for prolonged periods while performing their duties.



**DENTAL****SECTION**Orderly Emergency Treatment of Facial Injuries\*

Capt Jerome C. Stoopack DC USN, Chief of Dental Service; Capt Milan Diklich Jr., MC USN, Chief of Ear, Nose and Throat Service; and Lt Eugene J. Messer DC USN, Assistant Chief of Dental Service, United States Naval Hospital, Jacksonville, Fla. Oral Surg 16(7):888-891, July 1963.

The automobile and the airplane have made travel a luxury. With their increased speeds, however, has come a dramatic increase in the number of accidental deaths and serious injuries in our country. When an automobile or an airplane traveling at a high rate of speed strikes an obstruction, the person riding in this vehicle literally becomes a projectile. One of the most common disfiguring and serious injuries found in this type of accident—that involving fractures and lacerations of the facial structures—is considered here. Disfiguring facial injuries are quite obvious, even to the novice. Unfortunately, however, the most apparent part of a facial injury is generally not the most serious. All too often the well-meaning doctor in the emergency room repairs, with great care, extensive lacerations of the face as an emergency procedure. The patient is then referred to the oral surgeon for reduction of the facial fractures, and all the lacerations are reopened during this procedure.

In the case reported here this type of injury was treated in an orderly manner, with the extensive lacerations actually used for access to and reduction of the facial fractures.

**Case Report**

A 36-year-old Army sergeant was brought to the United States Naval Hospital in Jacksonville, Florida, following an automobile accident. Physical examination in the emergency room revealed a well-developed, well-nourished man in acute respiratory and circulatory distress as a result of massive facial fractures and lacerations. The patient was immediately given 500 c.c. of O-negative whole blood, and a tracheostomy was performed to maintain an airway. The patient was then taken to the operating room, where he was given

\* Capt J. M. Hanner, MC USN, Commanding Officer of this hospital recommended this excellent article to the Navy Medical News Letter.



a general anesthetic consisting of Pentothal sodium, nitrous oxide and oxygen, and Anectine. Here he was examined closely to determine the exact extent of the facial injuries. A portable x-ray unit was brought to the operating room, and posteroanterior and lateral skull films were taken.

The following diagnoses were positively determined at this time: bilateral compound fracture of the maxilla; bilateral compound fracture of nasal bones; bilateral compound fracture of the zygoma; compound fracture of the nasal spine; compound fracture of the alveolar process of the mandible; bilateral comminuted fracture of the orbital floor; fractures involving the maxillary sinus and walls of the nasal passage; lacerations of the walls of the nasal passage; traumatically acquired absence of eight maxillary anterior teeth; and multiple through-and-through facial lacerations extending from the angle of the mouth posteriorly approximately 8 to 10 cm. bilaterally.

The facial lacerations gave unlimited access to the oral cavity and the facial bones. Therefore, the first procedure in this case was not to suture the lacerations but, rather, to affix continuous wire loops to the three remaining maxillary molars bilaterally and a Winter arch bar from second molar to second molar in the mandible. With these in place, the foundation for reduction and immobilization of the facial fractures had been laid with little difficulty to the surgeon and without further mutilation of any soft tissue. The maxilla was then pulled forward and affixed to the mandible in good position, as determined by the interdigitation of cuspal relationships. For example, the mesiobuccal cusp of the maxillary first molar was placed into the buccal groove of the mandibular first molar bilaterally and held in that position by means of intermaxillary elastic traction. With the maxilla now in its proper position, the rest of the reconstructive process was comparatively simple. The avulsed free-floating portions of the nasal and antral walls were removed and the remaining pieces, which were well attached to the periosteum, were fitted into good anatomic position. Both antra were packed with petrolatum gauze, 1/4" wide, the free ends of which were brought out through the external nares. The nasal cavity was packed in the same fashion, and the general contour of the face began to take shape. With this accomplished, the lacerated soft tissue of the face fell normally into good position, giving the surgeon many anatomic reference points with which to begin his suturing. When the oral mucosa was sutured, the defects left by the loss of maxillary bone were covered but the continuity of the maxillary arch was maintained. Stay sutures were then placed at the vermilion border of the lips bilaterally, and finally the facial lacerations and lips were approximated and sutured in good position.

The patient tolerated the procedure very well and was returned to the ward in good postoperative condition. By this time the patient's blood had been typed and cross-matched, and the administration of whole blood was continued until 1500 c.c. had been replaced. Penicillin and streptomycin were given, and an enzymatic drug was prescribed in an attempt to reduce the facial edema.

The patient's postoperative progress was excellent, with the facial edema considerably reduced on the second postoperative day. On the fifth postoperative day all edema had subsided, and an attempt was made to reposition



the nasal bones by a closed method. This was not successful, however, and 3 days later an open reduction of the nasal fractures was performed. Circum-zygomatic wires were then placed and secured to the mandibular arch bar to keep the facial bones well immobilized. The tracheostomy was closed, and the rest of the patient's hospital course was uneventful. On July 12, 1962, four weeks after the surgical procedure, the patient was transferred to Martin Army Hospital at Fort Benning, Georgia, for convalescence and final disposition. At Fort Benning a maxillary prosthesis was constructed after all suspension wire, arch bars, and elastic traction had been removed. When the patient was examined at that hospital his condition was considered to be excellent, with all fractures and lacerations healing in good position. On July 31, 1962, the patient was discharged to full duty with no limitations.

**NOTE:** The clinical management of this patient serves as a convincing illustration of cooperative medico-dental teamwork in action. Reasonable and orderly planning of the timetable for each treatment procedure, as well as obvious skill in their execution, is a goal to which we should aspire in handling multiple severe injuries. Highly significant were the early tracheostomy, circulatory support, and stabilization and definitive attention to the bony structures and teeth.

—Editor

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#### Personnel and Professional Notes

Surgeon General's Greeting to Admiral Kyes and the Dental Corps. "As the fifty-first birthday of the Dental Corps draws near on August 22nd, I wish to take this opportunity to wish you a successful tour as Chief of the Dental Division and to extend greetings and best wishes to our dental officers, administrative officers and dental technicians who have through dedicated effort placed the Naval Dental Corps in an enviable position among dental organizations throughout the world. I am sure that with the backing of almost 5,000 well-trained and highly motivated dental personnel you will be able to continue the progress which has marked the Dental Corps during its first 50 years of existence."

ADA National Convention. Navy Dental Reserve Company 3-5, Port Newark, N.J., has been designated as host for the Navy get-together during the 1963 American Dental Association National Convention in Atlantic City, N.J. Arrangements have been completed to hold the affair on Monday, 14 October 1963, from 6 to 9 P. M. at the LaFayette Motor Inn which is one-half block from the ADA Headquarters on North Carolina Avenue. All Navy dental officers, Regular and Reserve, and their ladies are cordially invited to attend. Cdr B. F. Linn DC USNR is the CO of the Company.



Dental Impression Material. Alginate hydrocolloid impression material generated some field complaints due partially to the fact that some clinicians prefer a faster setting alginate. To accommodate a range of operative conditions FSN 6520-299-9676 Impression Material, Dental Hydrocolloid, Alginate Type, 1 lb. shall be replaced by the following items:

6520-826-1300	IMPRESSION MATERIAL, DENTAL, Hydrocolloid, Alginate Type, Regular Set, 1 lb.
6520-889-7028	IMPRESSION MATERIAL, DENTAL, Hydrocolloid, Alginate Type, Fast Set, 1 lb.

It has therefore become necessary to define the terms "Regular" and "Fast" as indicated in the above newly adopted items. It is to be noted that 83% of the alginate impression material consumed by the civilian trade is for the "Regular Set" (FSN 6520-826-1300). Inasmuch as industry is not standardized on the use of the terms "Regular" and "Fast" for the above items, the requirements as specified for the items are hereby defined:

A "Regular" setting alginate shall have a working (plastic) time of not less than 2 minutes; an initial set time of not more than 3 minutes; withdrawal time (finished impression removed from the mouth) of not more than 4 minutes.

A "Fast" setting alginate shall have a working (plastic) time of not less than 1 - 1/4 minutes; an initial set time of not more than 2 minutes; and a withdrawal time (finished impression removed from the mouth) of not more than 3 minutes.

The critical difference between the "Regular" and "Fast" setting material is a difference of one minute in a finished impression, for the requirements as specified for these new items. The terms working time, initial setting and withdrawal times are defined for proper understanding of the requirements as listed above.

Working time is defined as the time required for mixing, loading the tray and seating it in the mouth.

Initial setting time is defined as the time at which the material (alginate) exhibits a loss of stickiness to a dry finger.

Withdrawal time is defined as the time at which it is safe to withdraw the impression from the mouth. This generally should be one additional minute after the initial setting time.

Strict adherence to the INSTRUCTIONS FOR USE as outlined on each container is critical for effective use of these items.

Reclassification of Supply Item. Action has been initiated by Defense Medical Materiel Board to reclassify the following item Limited Standard, stock on hand to be issued until exhausted: FSN 6520-500-2050 Silver Alloy Powder, Dental, 5 oz.

It is essential that all activities have on hand ready for use FSN 6520-889-5727 Capsule and Pestle, Dental Amalgamator, 12s, to properly triturate FSN 6520-853-8346 Silver Alloy Pellet, Dental 400s, 5 oz., since



FSN 6520-500-5150, Capsule and Pestle, Dental Amalgamator is not suitable for use with the Alloy Pellets.

Newly Standardized Items Available for Issue.

<u>FSN</u>	<u>Nomenclature</u>	<u>Unit of Issue</u>	<u>Unit Price</u>
6520-720-9666	Bur, Dental Excavating, AHP, Tungsten Carbide, No. 559, 6s	PG	2.50
6520-721-6284	Bur, Dental Excavating, AHP, Tungsten Carbide, No. 35, 6s	PG	2.50
6520-823-8171	Plastic Strip Dental Matrix, Polyethylene Terepathalate, Clear, 45 Feet	RL	.50
6520-826-1301	Wire Platinum Alloy, Round, 1 Foot, 22 Gage	FT	4.17
6520-864-5516	Wax, Dental, Inlay, Ivory, 1 Oz	BX	.49
6520-890-1304	Holder Rubber Dam, Dental "U" Shaped	EA	1.80

Captain Bartelle Presents Seminar. Capt August Bartelle DC USN presented a two day seminar, "Technics of Full Denture Construction," before the Philippine Dental Association in Manila, 12-13 May.

He was presented a Merit Award by the Board of Directors of the Olongapo Dental Society, Olongapo, Republic of the Philippines, on 3 June 1963. The citation read "In special recognition for services to the Dental Profession."

Capt Bartelle is on duty at the U. S. Naval Communication Station, San Miguel, Luzon, Philippine Islands.

Naval Dental Officers Receive Honors. Captain Louis S. Hansen DC USN, Chief, Dental and Oral Pathology Division, Armed Forces Institute of Pathology, was recently installed as President-Elect of the American Academy of Oral Pathology at its Annual Meeting in Miami Beach, Florida.

Commander George H. Green DC USN, Staff Member in the Dental and Oral Pathology Division, AFIP, was elected to Fellowship status in the Academy at the same meeting.

Commander Boyne Lectures at University of Alabama. Cdr Philip J. Boyne, Chief, Dental Service, U. S. Naval Hospital, Key West, Florida, appeared as guest lecturer for oral surgery interns and residents as well as all basic science postgraduate students at the University of Alabama Medical Center on 6 and 7 June. Dr. Boyne's topics were: "Experimental Evaluation of Bone Grafts Materials," "The Healing of the Human Post Extraction Alveolus," "Bone Repair of Large Surgical Defects," "Effects of High Speeds on Bone Repair," "Oblique Osteotomy of the Mandibular Ramus for Correction of Prognathism," "Surgical Restoration of Edentulous Alveolar Ridges."

A Clinical Pathological Conference was held at the close of the two-day program.



## AVIATION MEDICINE DIVISION



### Air Crew Survival at Sea - Water Supply\*

Capt Roland A. Bosee MSC USN, Air Crew Equipment Laboratory, Naval Air Engineering Center (NAEC), Philadelphia 12, Pa.

This presentation is limited to the equipment area of water supply for air crew survival at sea. While water that is currently available in sealed cans (1) is medically preferred for survival purposes, the cube and weight limitations imposed by present aircraft construction prevent its use. Some means of converting sea water to potable water must be utilized. For this purpose, we now use the desalter kits (2) and the solar still kits (3) for our air crew survival water supply. Basically, there has been no significant change in this equipment since World War II. We entered World War II with canned water and solid-fuel sea-water stills and at the conclusion of the war we had the desalting kit and its back-up mate, the inflatable solar still.

### Fighter Type Aircraft Survival Kits

To better understand why our survival-water supply equipment has not advanced technologically since World War II, let us first look at the fighter aircraft survival kit.

#### a. Survival Equipment Offered (4)

In addition to the PK-2 pararaft, we offer a variety of equipment considered essential for use in the fighter aircraft survival kit. The listing is as follows:

- |                            |   |
|----------------------------|---|
| (1) Desalter kit           | (8) Transceiver radio                         |
| (2) Solar distillation kit | (9) Radar corner reflector                    |
| (3) Water storage bag      | (10) SEEK-1, survival, escape and evasion kit |
| (4) Survival rations       | (11) Sponge                                   |
| (5) Dye marker             | (12) Poncho                                   |
| (6) Signalling mirror      | (13) Sunburn ointment                         |
| (7) Distress signals       | (14) 50 foot nylon cord                       |

#### b. Kit Size Limitations (5)

While we offer all these survival aids, including survival water sources, because of cube limitations of the ejection seat, we cannot fit all

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\*Presented at a special meeting of the Advisory Group for Aeronautical Research and Development (AGARD) (sponsored by NATO) at Athens, Greece in July 1963.



these aids into every type aircraft survival kit. The ballistic type ejection seat set a premium on space and weight available for survival equipment. The survival equipment kit size varies with the particular aircraft but, in general, kit dimensions exclusive of the pararaft range from:

15" length x 7-1/2" width x 4-1/2" depth

15" length x 4-1/4" width x 3-1/2" depth

These then are the parameters for the containment of the survival aids in fighter type aircraft.

c. Effects of Field Decisions on Survival Aids. (6)

The narrow limits for containment of survival aids in the survival kit make each individual aid competitive, one with the other. Selection of the offered survival equipment is left to the discretion of the type and force commander to meet the particular operating conditions. In the fighter craft area, there is a trend to trade off the sole survival water sources—the solar still and the desalting kit for locator devices (7) and the SEEK-1 kit (8).

d. The Water Dilemma.

We at the Air Crew Equipment Laboratory are in the unhappy position—if you will excuse this—of carrying water on one shoulder and an empty bucket on the other. On one hand, we are trying to develop a small package size solar still that will be more competitive in size than the current pack still and, on the other hand, we have developed the SEEK-1 kit (9), the use of which in the fighter aircraft survival kit may possibly displace the desalting kit. There has been a strongly endorsed proposal (10) to trade off the desalting kit for the SEEK-1 in the Martin-Baker seat survival kit, but we have questioned this and requested a statistical study by the Naval Aviation Safety Center, Norfolk to determine the desirability of the trade-off (11).

Survival Kits for Larger Aircraft

While the survival water supply on fighter type aircraft is tending to dry up, larger aircraft using the multi-place rafts are supplied with desalting kits and solar still on a general ratio of 1 desalter kit and 1 solar still for each raft rated occupant exclusive of the 20-man raft which has a somewhat reduced equipment ratio. The more desirable canned water so widely used by our surface craft is not used on aircraft because of weight and space considerations. Sea water distilling units requiring the use of solid fuel that have been offered for consideration to date have been found unacceptable because of weight, size and hazard from heat and hot distillate. Efforts to develop a reliable sealed plastic container that will yield through irradiation, a bacteriologically sterile and potable water after long-term storage are being pursued by industry, but again, weight and space limitations would preclude the possibility of ultimate application to aircraft.

Recent Developments in Equipment and Procedures

While no new survival water equipment has been adopted, we are doing some work in the water equipment area.



a. Current Design Solar Still.

During recent Air Crew Equipment Laboratory sea tests (12), we found that the current use MIL-D-5850 sea water solar stills of from 5 to 12 years shelf age can produce from 1 to 1-1/2 pints of survival water per day in moderately rough to calm seas and sunny skies provided the stills were properly manufactured. We believe that field complaints to the effect that our stills produce a refined brand of sea water are caused by faulty manufacture. We are tightening the inspection requirements on the still at the manufacturing level and are working out a dynamic still operating test for inclusion in the still specification.

b. New Design Solar Still.

We are also trying to develop an improved solar sea water distillation kit with greater output of potable water, smaller package size and more simplified construction than the present kit. Our first prototypes did not fare well in a sea test, but we expect better results from improved models which will be constructed this year.

c. Desalting Kits. (13)

Past manufacturing improvements in the desalting kit chemical have made it feasible to extend the service life of the desalter kit. In this connection, I would like to call your attention to the recent SPCC Instruction 4440.351A of 17 March 1963 which permits extension of the present 5 year shelf and service life of the desalter kit provided 1% of the overage kits sampled at random by the user on a yearly basis meet the following requirements:

(1) Moisture content of desalting chemical is not more than 5%.

(2) pH of effluent water is not greater than 10.5 after 45 minute treatment with the desalter chemical.

(3) Effluent water is palatable (non-salty).

If these requirements are met, the entire lot of overage kits is considered usable. If the tested kits do not meet these requirements, they are to be replaced with fresh stocks. While this instruction now applies to desalter kits aboard ships, a parallel provision is being prepared for the aircraft area.

## Conclusion

The Air Crew Equipment Laboratory will continue to search for new or improved means for converting sea water to potable water that is more competitive to the cubic limits of fighter aircraft survival kits than the current use equipment. While no practical alternative to our present water supply equipment is imminent, we are directing our efforts to reduce the package size and increase the reliability of the solar still and are studying the possibilities of a smaller size desalting kit especially designed for fighter aircraft survival kits.

## REFERENCES

1. MIL-W-15117, Canned Emergency Drinking Water.
2. MIL-D-005531C, Desalter Kits; Sea Water, MK-2.
3. MIL-D-5850C, Distillation Kits, Sea Water, Solar.



4. BUWEPS Aviation and Survival Equipment Bulletin No. 32-57.
5. A Feasibility Study Concerning Survival/Flotation and Locator System for NPF, El Centro, California by Matrix Corporation under Contract N123 (246)25920A.
6. Same as reference 4.
7. Proposed bulletin by El Centro for Inclusion of PRC/49 Transceiver in Scott Survival Kit of F4H Aircraft.
8. CO VF-84 letter Ser 375 of 19 October 1962.
9. BUWEPS Experimental Specification XRAAE-17 of 30 December 1960 for Survival, Escape and Evasion Kit, Individual Airman's, Type SEEK-1.
10. Fourth End on CO VF-84 letter Ser 375 of 19 October 1962 from Commander, Naval Aviation Safety Center.
11. Fifth End on CO VF-84 letter Ser 375 of 19 October 1962 from CO, NAEC XG-36:JJM:aea 10470(1) (4630) of 22 April 1963.
12. Formal Report NAEC-ACEL-500, Solar Stills for Air Crew Survival Water Supply of 7 June 1963.
13. SPCC Instruction 4440.351A of 12 March 1963 and CO, NAEC letter XG-36:JJM:aea 10470(16) (4685) of 21 May 1963 to COMSERVLANT.

\* \* \* \* \*

#### Some 20/20 Tips for the Flight Surgeon

Cdr W. L. Erdbrink MC USN, Head, Ophthalmology Division, U. S. Naval School of Aviation Medicine, Pensacola, Florida.

Case 1. A 25 year old MarCad sustained right facial injuries in November, 1961 when he "fell out of the bunk and hit an open dresser drawer." He sustained a fractured maxilla which required extensive oral surgery, and developed a chronic dacryocystitis with epiphora on the right. The right nasolacrimal duct was obstructed and a dacryocystorhinogram revealed normal canaliculi and sac but an obstruction of the duct just inferior to the sac. On 1 June 1962, a right dacryocystorhinostomy was performed with a good result. He was presented to the Special Board of Flight Surgeons (SBFS) on 9 July 1962 and returned to a flight status.

Comment: This MarCad was injured while in the flight training phase of carrier qualifications in the T-28. He was grounded a total of 8 months prior to returning to flying. He is now a designated Naval Aviator. Any nasal lid or bony injury of the face should remind the examiner to think of the integrity of the nasolacrimal duct system.

Case 2. A 38 year old Lt Col, USMC Aviator, with 4100 hours of single engine and jet time was evaluated in May 1962 for myopia. He wanted to remain in Service Group I, but visually, VOD 20/40 with -0.75 sphere ■ 20/20, VOS 20/30-2 with -0.50 sphere ■ 20/20, he was qualified only for Service Group II. He was never presented to the SBFS because of an abnormal urinalysis, a



left flank mass found on a good general physical examination, and a G. U. evaluation revealed a renal neoplasm.

Comment: Ordered here to have his myopia evaluated, and ended up having surgery for cancer.

Case 3. A 31-year-old Airman was admitted to the Neurology Service on 20 October 1962 with a weeks history of difficulty in expressing himself and of understanding others; also, of a blank space in his right field of vision. His speech was hesitant with slurring, repetition, and mispronunciation. His understanding of the spoken word was markedly limited as was reading and writing. The neurological examination was normal other than the receptive aphasia, but central visual fields showed a dense right superior homonymous quadrantanopia (Meyer's loop) to 1 & 5/1000 W test objects. He was evacuated to a neurosurgical center.

Comment: This dysphasia and visual field defect places the lesion in the left temporal lobe.

Case 4. A 39-year-old LCdr, F4H pilot with over 3500 hours, was evaluated by the SBFS on 18 June 1962 with a complaint of decreased vision in the left eye for 4 months. The referring diagnosis was retrobulbar neuritis.

The VOS was 20/40 and could not be improved with lenses. On the Amsler grid, there was a distortion of the fixation area (metamorphopsia), otherwise, the visual fields were normal. There was no foveal light reflex on ophthalmoscopy O.S. and a white area was present in the macula; slit-lamp examination of the retina showed the left macula to be elevated. He was placed on priscoline 25 mgm q.i.d. and within 4 days the VOS had improved to 20/25. He was placed in Service Group III for six months. A re-evaluation on 25 January 1963 showed VOS 20/20-4, a 2° relative central scotoma O.S., but the macula was flat. He was returned to Service Group I with a waiver recommended for the VOS.

Comment: This is a case of macular edema or a central serous retinopathy. Any vision not correcting to 20/20 must be evaluated from the cornea back to the retina, even to area 17.

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#### Some Eye Disqualifications for SNA

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Case 5. A 25-year-old Ens USNR, SNA was evaluated on 7 May 1962 with a cycloplegic refraction from a NAS of +1.75+0.75 x 90 in each eye. Transposing this refraction, +2.50-0.75 x 180, it is seen that this is the absolute cycloplegic maximum sphere and cylinder for flight training. Our cycloplegic refraction revealed +3.25-0.50 x 180 in each eye. He was disqualified for flight training.

Comment: One suspects that the examining flight surgeon was just being "a nice guy" when he recorded the maximum refractive findings on the SF 88.

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Case 6. A 23 year old AOC(1395)SNA was disqualified for flight training on 14 May 1963 with the following defects: VOD, VOS 20/20-3, cycloplegic refraction O. U. of Plano-0.50 x 180; 6M - 6.0 eso with a prism divergence of 4/8 and red lens diplopia; Verhoeff 6/16.

Comment: He had been qualified with a Plano refractive error, 0.0 -phoria, but had never before seen the "black box" for depth perception. Even the "Whole Man Concept" of BuMed Inst. 6110.6 of 17 January 1963 could not qualify him.

Case 7. A 25-year-old NavCad was referred by the Aviation Examining Room (AER) on 22 May 1963 with a 1.6 LH. Versions revealed an underaction of the LIR muscle. Prism cover test at distance showed 8.0 LH and 12.0 exo, and an intermittent tropia; intermittent occlusion of the Maddox rod revealed a 4.0 LH and 8.0 exo.

Comment: He had passed two previous P.E.'s at different air stations with 0.0 and 1.0 vertical -phorias.

### Some Refraction Problems

Case 8. A 23-year-old AOC was examined on 29 May 1962 in that he wished to transfer to SNA. The unaided VA on repeated occasions was VOD 20/20-2, VOS 20/20-3. The ocular examination was totally normal and a cycloplegic refraction O.D. +1.00-0.25 x 10, O.S. +0.75-0.25 x 175 = 20/20. At a post-check examination, he had an unaided VA of 20/15 when the letters were presented individually; binocularly, he had a 20/15-3.

Comment: This is an example of "separation difficulty" or a "crowding phenomenon" (American Journal of Ophthalmology 50:471, March, 1962) where true uniocular foveal fixation is difficult when viewing a row or a group of VA symbols. He was qualified as a SNA. (Cannot see the trees for the forest—scans well—may be a great instrument pilot.)

Case 9. A 22-year-old AOC was evaluated on 29 June 1962 when he applied for transfer to SNA status. He had previously been disqualified in the field as a SNA with the following refractive error: O.D. -0.25 sphere, O.S. Plano = 20/20 O.U. The ocular examination was totally normal and our refraction revealed O.D. +0.75-0.50 x 10, O.S. +0.50-0.25 x 160 = 20/20 O.U. He was qualified as a SNA.

Comment: The flight surgeon in the field is challenged with many "administrative refractions." To do his job well, he should accept this challenge. Cycloplegic refractions on candidates are such for SNA. Here, we have a "sloppy refraction" that "shot down" a well motivated college graduate. The NAO program salvaged one man for a "set of wings."

Case 10. A 22 year old AOC was referred by the AER on 24 July 1962 for an evaluation of an unaided vision of 20/50 in each eye. A cycloplegic refraction revealed a +0.25 sphere refractive error in each eye correcting to 20/20.



Comment: The first few weeks in Pre-Flight (or in aviation situations in general) can be traumatic. Here we have the parasympathetic vegetative nervous system overreacting to stress producing ciliary spasm and a false myopia. The retinoscope and good cycloplegia will make the Dx. He was qualified as a NAO (I) & (B)(H).

### Some Motility Problems

Case 11. A 21-year-old ADJ-3 was seen in the Student Flight Surgeon's refraction clinic in February 1962. His real complaint was of diplopia. In January 1962, he was involved in an automobile accident and hospitalized in another area with the diagnosis of cerebral contusion, fractured nasal bones and facial lacerations.

VOU 20/20, 6M - 5.0 LH, a head carriage of tilt to the right shoulder, chin down and face turn to the right, versions and red lens tests showed the LH to be greatest down and right - all Dx of a LSO weakness. Caldwell views revealed a "crushed" antero-medial wall of the left frontal sinus and superior rim of the orbit. Also, he had a gross "dent" above the left brow medially. He was managed with occlusion of O.D. and by May 1962 the compensatory head tilt and diplopia had disappeared. In July 1962, a tantalum mesh implant was inserted beneath periosteum filling the forehead depression, and a good cosmetic result was obtained.

Comment: A median brow fracture with trochlear injury and a SO weakness.

Case 12. A 21-year-old Ensign, SNA, was referred by the AER for an evaluation of 10.0 eso. On repeated Maddox rod testing, readings varied from 5-10 eso; however, prism cover test showed only 2-3 diopters of esophoria at distance. The distance and near prism divergences were normal and there was no red lens diplopia.

Comment: "Instrument convergence" excessive Maddox rod eso.

### Several Motivation Cases

Case 13. A 24-year-old Ensign, SNA, from VT-2 with 40 hours of flying was admitted on 11 July 1962 for pterygium surgery O.D. A scleral bearing excision was performed and a total of 3000 REPS of Beta radiation were given post-operatively. While on the sick-list he decided to DOR. He stated: "It takes more guts to DOR than to fly." Having an engineering degree, he obtained orders to an advanced Aviation Electronics School to be a ground officer.

Case 14. The saga of a Marine's Marine. A 19-year-old MarCad appeared before a Board of Medical Survey (BMS) on 26 September 1961. He had sustained blunt trauma to O.D. at age 14 and surgery had been performed for a retinal detachment. Since then, he had been at full activity in contact sports.



The ocular examination was totally normal other than surgical chorioretinal scars from 9-12 o'clock in the periphery of O.D. The BMS gave him a physical profile of E-4 and citing AR 40-501, C-1 of 2-10-61 that a history of retinal detachment was disqualifying for duty. This MarCad rebutted the Board's findings and appeared before the Physical Evaluation Board of the Sixth Naval District which found him fit for duty. He then requested an appearance before the SBFS and on 17 November 1961 was found PQ and AA DIACA as a SNA. BuMed approved this recommendation and on 9 January 1962 he started Pre-Flight. He is now in advanced training.

Case 15. A 22-year-old Ensign, recent Naval Academy graduate, appeared before the SBFS on 27 July 1962. He had a WPW Syndrome by EKG and the vision in each eye was 20/20-2 with a Plano-0.25 x 90 refractive error. A BuMed endorsement dated 16 August 1962 agreed with the recommendation of the Board that a waiver be granted for the WPW and that he be placed in the "Myopic Study Group" and qualified as a SNA.

Comment: The Board's decision was primarily influenced by the NP evaluation - His father died of pneumonia when he was one year old; his mother died of cancer when he was age 7; at age 9, his foster parents divorced and he lived with his foster mother; he gained a private pilot's license when 18 and graduated from the Naval Academy in the upper 1/3 of his class - "Considering his traumatic background, he exhibits more emotional strength and stability than would commonly be expected....good capacities for making flexible adjustments to difficult situations....above average emotional maturity....he has learned and profited from what for most people would have been disabling circumstances." This officer is now in advanced jet training, having been at the top of his class throughout the flight training program to date.

Case 16. A 26-year-old 2nd Lt., USMCR, SNA, was evaluated in April 1962 on a post-hospitalization physical examination. Surgery had been performed for a torn cartilage of the left knee. He complained of headaches, poor vision in each eye and walked with a cane (not given to him by the Orthopedic Service).

VOD, VOS 20/25, cycloplegic refraction of +1.00-0.25 x 90 = 20/15 O.U., totally normal ocular examination.

Comment: An orthopedic variant of the "fear of flying syndrome" - not only could he not see himself flying, but he could not stand the program.

#### BuMed Inst. 1910.2C - EPTE

#### Not Qualified for Duty - Surveyed from Service

Case 17. A 23-year-old AOC, SNA, was admitted to the hospital on 19 September 1962 after being referred by the AER for an evaluation of his accommodation. At the age of 16, he sustained a head injury playing football, had a right esotropia with diplopia for 1 year; after this returned to normal, he had difficulty in reading which has been progressive. VOD, VOS 20/20-4 with +1.50 sphere = 20/20 O.U. Accommodation 3.3 in each eye and monocular J-2 near vision. The above lenses corrected the near vision to J-1.



Comment: A post-traumatic paralysis of accommodation (equivalent to a 46 year old) requiring reading glasses at age 23.

Case 18. A 25-year-old AOC, SNA was examined on 4 September 1962 and had some type of right eye injury at birth, knew the eye was more prominent than the left, and was aware of diplopia on gaze to the right and up and right.

The vertical palpebral fissure on the right was 3mm greater than that of the left; 4mm of right proptosis were present; there was an incomplete right N III paralysis with weakness of the RSR, RIR and RIO; also, sensory divisions I and II of left N. V were out.

Comment: A confusing case, but the proptosis of O.D. was obvious and should not have been missed.

Case 19. A 22 year old AOC, SNA evaluated on 4 September 1962, had been aware of "dancing eyes" all his life. He had a vestibular jerk type congenital nystagmus in the primary position that could be seen by any observer at a 6 foot distance. This nystagmus permitted only a 20/20-4 unaided visual acuity. The nystagmus was present in all positions of gaze, but was extremely gross on levo- and dextro-version with the quick component in the direction of gaze and with the abducted eye jerking to a greater extent than the adducted eye.

Case 20. A 19-year-old Airman appeared before a BMS on 3 August 1962 and was surveyed from Service with EPTE eye defects. Since the age of 7, he had been wearing "thick glasses." VOD 20/400 with +9.00-1.00 x 180 = 20/60, VOS 20/200 with +9.00-1.00 x 180 = 20/30; 10 prisms of right esotropia were present and there was no fusion. Mild amblyopia in each eye, O.D. due to the esotropia, O.S. due to the refractive error. AR 40-501, C-1 of 10 February 1961 states that a spherical equivalent of more than +8.00 or -8.00 is not qualified for Service.

Comment: Would you want this Airman on your flight deck?

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#### Biomedical Evaluation of Pilots During Flights Under Stress

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Lt Frank Formeller, MSC USN, Aero Medical Branch, Service Test Division, Naval Air Test Center, Patuxent River, Md.

The current emphasis on human performance in the control of spacecraft and supersonic airplanes required the Navy to initiate a study of methods of determining stress induced deterioration of human performance prior to overt fatigue. Naval Air Test Center pilots performed various flight tasks in a specially instrumented Navy two-place jet airplane. North American Aviation instrumented the airplane for flight parameters, and NASA Ames Laboratory, Moffett Field, California, provided a bioelectric package to monitor pilot



physiological parameters. NATC supplied all medical support necessary for the successful completion of this project.

Twelve airplane parameters including accelerations (3 axes), at various locations in the cockpit, lateral control stick positions, rudder positions, yaw rate, roll rate, and pitch rate were recorded on magnetic tape. The 6 physiological parameters measured included blood pressure, respiration rate and volume, 3 EKG recordings and accelerations experienced by the pilot at his head and hip (3 axes each position). These were also recorded on magnetic tape. Pre and post flight blood and urine samples collected were sent to Ohio State University for quantitative physiological chemical analyses.

The 3 EKG signals were amplified by transistor circuitry which contained a common mode for maximum noise rejection. Every 2 minutes the typical blood pressure cuff on the arm of the pilot was inflated by a nitrogen bottle. The cuff inflating pressure was monitored by a pulse wave amplifier. A small microphone was used to sense systolic and diastolic pulses from the brachial artery immediately below the cuff. These pulses were amplified in the package by transistor circuitry. The respiration rate and tidal volume were determined by a strain gage circuit inserted in a typical military oxygen mask and a Statham Instrument CA-9 strain gage amplifier.

Potentiometers were included in the respiration circuitry for amplifier sensitivity adjustment. Since the frequency response of the strain gage was relatively flat, from 0 to 2000 cps, it was calibrated with a gas flowmeter in order to determine the actual volume of each inspiration.

Stress was induced by the accelerations experienced by the pilots during high speed low level flights over irregular terrain. During these flights the pilots were required to follow one of 2 types of visual flight profiles previously programmed for presentation on a special cathode ray tube - either a simple altitude hold task of 200 feet or a more complicated vertical tracking task.

During each flight both the pilot and the safety pilot filled out subjective information cards every 5 minutes. The information recorded included their evaluation of the roughness of the flight (rated 1 to 5), fatigue (1 to 5), and, on some flights the flying qualities of the airplane. Post flight reports were also required on each flight. Five subjects participated in 32 evaluation flights.

NATC has not yet received some of the pertinent data required to formulate a complete correlation of subjective and objective physiological stress and biochemical changes. Partial reduction of physiological data has revealed deviations from normal parameters with respect to respiratory tidal volumes. There was a significant reduction in respiratory minute volume of several pilots recorded during the latter portion of some flights. This was a routine occurrence not limited to flights during which fatigue was reported.

In view of recent research concerning the effects of vertical vibration upon man, it is strongly suspected that this reduction in respiratory minute volume may be the result of the accelerations experienced by the pilots. It is anticipated that there will be a correlation between the physiological data, the



physiological chemical changes, the subjective reports of stress, and relative ability to perform assigned tracking tasks.

Development of improved techniques of obtaining EKG's under dynamic conditions and refined methods of measuring blood pressure and respiratory volumes under dynamic conditions are needed. Additional biomedical evaluations of test pilots under varying conditions of stress are being conducted at NATC.

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### HISTORICAL ITEMS

BUMED News Letter, Aviation Supplement, Vol. 1, No. 8, 24 December 1943.

Night Blindness: According to Wosika, night blindness of war was first reported during the Crusades and since that time almost all major military efforts have encountered problems of night blindness, particularly wherever overstraining, heat, sun blinding, hunger and thirst have occurred. The first world war was responsible for much literature on this subject. The term night blindness of war embraces organic and idiopathic night blindness. In the literature poor dark adaptation as measured by instruments also has been included under this term. Malnutrition (lack of Vitamin A) causes night blindness, xerosis and xerophthalmia. Therapeutic correction is simple, swift and sure. Poor dark adaptation does not seem related to night blindness, xerosis, xerophthalmia or food inadequacy. Therapeutic correction is not successful even with huge supplemental doses of vitamin A. In the present state of knowledge of scotopic vision, night blindness and poor adaptation must be differentiated. It is suggested that further work with the rate and end values of dark adaptation concerning rods, cones and influences of the nervous system be performed in an attempt to establish a firm physiologic basis for dark adaptation tests. While dark adaptation tests do measure the ability to see in low luminosity, the controlling mechanism is not established, the relation to vitamin A is not clear and its usefulness in military medicine as regards night blindness of war must be questioned, although further refinements of technic may enhance the value of the test. (War Medicine, Sept. 1943, from Summary JAMA, Nov. 13, 1943)

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Portable Aviation Medicine Dark Room. Alvin Frederick Williams, CPhM(AA) has submitted to the Bureau suggestions for a portable Aviation Medicine Dark Room. CPhM Williams who is serving with the First Marine Aircraft Wing has improvised a portable aviation medicine dark room by use of the following procedure: . . . . A large black canvas tow sleeve, normally used for anti-aircraft practice, was slipped around and suspended on 4 cables of aircraft control wire, thereby maintaining the tow sleeve in a square suspended tunnel position. At the small end was placed the standard Snellen Test Chart and lights. At the larger entrance was placed the chair and phorometer. A canvas drop sheet was used to close the tunnel. By this simple improvisation it has been possible to establish a dark tunnel in a large tent, for practical field service.

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**RESERVE****SECTION**

Promotion of Officers  
(concluded)

Inactive duty Naval Reserve Medical Service Corps officers selected for promotion to the grade of Lieutenant Commander by the selection board convened 23 April 1963:

Slanetz, Charles A.  
Smalley, Richard V.  
Smith, Bradley E.  
Smith, Darell Jene  
Smith, Norman T.  
Smith Paul B.  
Smith, Theodore C.  
Smith, Vaughn  
Smith, Whitman E.  
Solitare, Gilbert B.  
Somerndike, John M.  
Spear, Curtis V.  
Spencer, Max J.  
Spiegler, Robert Lee  
Stackpole, Robert H.  
Stahl, Donald C.  
Standifer, John J.  
Stang, Richard E.  
Stavola, John J.  
Stetzer, Samuel S.  
Steuer, Rudolph Robert  
Stiehm, Ewald R.  
Stone, Donald W.  
Storz, William J. Jr.  
Strem, Bruce E.  
Stunkle, Gene G.  
Sturim, Howard S.  
Suelzer, John G.

Sullivan, William A.  
Szozypinski, Adam F.  
Talmadge, Bruce A.  
Taub, John S.  
Taylor, James H.  
Taylor, Jane F.  
Taylor, William C.  
Tether, Robert S.  
Thaidigsman, James H.  
Thillet, Ives C.  
Thoma, Margaret F.  
Thomas, Gardner Jr.  
Thornton, Francis J.  
Thorsell, Harold G.  
Tindall, Harry C.  
Todd, Nevins W.  
Tolley, John A. III  
Torkelson, Leif O.  
Tossy, Jerome D.  
Toyama, William M.  
Trout, Monroe E.  
Vick, John B.  
Vidone, Romeo A.  
Vinson, Raphael Will  
Vuksta, Michael J.  
Wagner, William L.  
Wahle, John Philip Jr.  
Walters, Philip G.  
Walwick, Earle R.

Wassink, Roger N.  
Watson, Charles H.  
Weinand, Ernest E. Jr.  
Weiss, Edward B.  
Weiss, Marshall F.  
Welty, Paul B. Jr.  
White, Welbourne A.  
White, William B.  
Wickstrom, Otto W.  
Williams, Langdon T.  
Williams, Leo J. Jr.  
Wilson, Myron R.  
Wine, Jean F.  
Winters, Louis Micha  
Wirth, Edward C.  
Wise, Melvin S.  
Wolfe, Stuart  
Wolfe, William F.  
Wood, Edward T.  
Wood, George H.  
Woodson, Riley D.  
Wootton, Percy  
Wysocki, Raymond L.  
Yanders, Armon F.  
Yates, Andrew Jacks  
Young, Richard W. Jr.  
Zaas, Robert D.  
Zimmerman, Lamar T.



Inactive duty Naval Reserve Medical Service Corps officers selected for promotion to the grade of Lieutenant by the selection board convened 23 April 1963:

Bell, Robert Wayne	Frumkin, Paul	Ostrem, Carl T. Jr.
Brown, Burdeen Fred	Hantsbarger, W. M.	Powers, Kendal
Correia, Manning J.	Haynes, Jack R.	Reich, Melvin
DeWalt, Richard C.	Hood, James Leslie	Scudder, Myron V.
Dougherty, Mary E.	Lindberg, David S.	Steyaert, Thom
Emerson, George S.	Lucas, John R.	Suitor, Earl C.
Fournier, Eleanor M.	Maschmeyer, Elwood P.	Taylor, George F.
Froehlich, Herbert P.		Waddell, Robert A.

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#### Travel and Residence Overseas of Naval Reservists

The circumstances which necessitated that Naval Reservists obtain permission to travel or reside overseas in excess of 30 days have been overtaken by events. Current requirements will be met by advising the command holding the service record of intent to travel or reside overseas, as indicated by the following Change to subparagraphs 2 and 3 of the BuPers Manual, Article H-31401:

"A Reservist on inactive duty who plans to travel or reside overseas for a period in excess of 30 days is required to submit notice of intent to the command holding his service record. Such notice shall include destination or itinerary, expected duration of residency or travel, and mail address."

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#### American Psychological Association Holds Annual Meeting

The annual meeting of the American Psychological Association will be held in Philadelphia, Pennsylvania during the period 29 August to 4 September 1963. One retirement point per day may be credited to eligible inactive Naval Reserve Medical Department officers for attendance at the sessions of the military symposium sponsored, supervised and conducted by the Chief, Bureau of Medicine and Surgery.

Cdr W. G. Cumming, Jr., MSC USN who will represent the Bureau of Medicine and Surgery, will record and report attendance of eligible inactive Naval Reserve Medical Department officers.

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American Academy of Dermatology  
to Hold Annual Meeting

The annual meeting of the American Academy of Dermatology will be held at the Palmer House, Chicago, Illinois, during the period 30 November - 5 December 1963.

A Military Section in conjunction with this meeting will be held on Monday, 2 December 1963 from 2:00 to 4:30 P.M. The Bureau of Medicine and Surgery has been advised that the Military Section will be sponsored, supervised, and conducted by the Department of the Air Force, and this session will be at least two hours in duration. By authority of the Chief of Naval Personnel, one retirement point may be credited to eligible Naval Reserve Medical Department officers in attendance provided they register with the military representative present.

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American Psychological Association  
Holds Annual Meeting

The annual meeting of the American Psychological Association will be held in Philadelphia, Pennsylvania during the period 29 August to 4 September 1963. One retirement point per day may be credited to eligible inactive Naval Reserve Medical Department officers for attendance at the sessions of the military symposium sponsored, supervised and conducted by the Chief, Bureau of Medicine and Surgery.

Permit No. 1048  
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OFFICIAL BUSINESS

DEPARTMENT OF THE NAVY

NAVY DEPARTMENT  
POSTAGE AND FEES PAID